UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

AUG 24 1990

John D. Reggi
Ormet Corporation
Route 7 P.O. Box 176
Hannibal, Ohio 43931

REPLY TO ATTENTION OF: 5HS-11

Re: Agencies Request for Additional RI Fieldwork

Dear Mr. Reggi:

Pursuant to Section XIII. of the Ormet Corporation Site RI/FS Consent Order the Agencies must request the Ormet Corporation to obtain additional information in efforts to adequately quantify the air pathway for inclusion into the Endangerment Assessment (EA) for the Ormet Corporation Site.

As you are aware, the Ormet Corporation Site EA is now underway. Initial air dispersion modeling strategies have identified the need for particle sizing analysis for input into the Cowherd (1985) Model. The Cowherd Model will be used to calculate an emission rate of PM_{10} from each waste area (the five (5) Disposal Ponds and the Potliner Storage Area). The absence of particle size distribution data presents a critical data gap. This letter offers Ormet the opportunity to decide to:

1. Conduct field sieving analyses of the six (6) waste areas, or

2. Provide an estimate of particle size based on soil boring information collected previously. Note: Soil borings were taken during the Phase I RI in the Potliner Storage Area.

The Agencies have chosen to utilize the emission modeling rather than utilize data obtained during the air monitoring for PM_{10} to calculate an emission rate, which was conducted at the Ormet Corporation Site from March, 1988 to December, 1988. The Agencies decision was based on the fact that the air monitoring sampling event measured all sources of particulates (the manufacturing areas, the five (5) waste areas, and any other sources in the area). The EA for Ormet, however, is concerned only with particulate emissions from the Potliner Storage Area, the five (5) dried Disposal Ponds and their contribution to inhalation exposures to both on-site and off-site receptors. As an example, a preliminary calculation utilizing available information and assumptions estimated a PM_{10} concentration of 11 mg/m^3 at the perimeter of Disposal Pond #5 at AM-2. This calculation was for Disposal Pond #5 only and is considerably less than the average monitored concentration of 42 mg/m^3 measured at AM-2. These preliminary calculations, subject to further refinement, are shown in Attachment #1. Essentially, the Agencies felt that utilizing this air monitoring data would significantly overestimate PM_{10} emissions. However, the Agencies do intend to utilize the air monitoring program results as a "Reality" check on the Cowherd Model.

In order to quantify the air pathway the Agencies have chosen to calculate the emission rates from the six (6) waste areas, and use the Industrial Source Complex Long Term (ISCLT) Model to predict PM_{10} at the exposure points of interest. Exposure point concentration can then be calculated on a chemical by chemical basis, assuming that each contaminant of potential concern detected in the Disposal Ponds is associated with PM_{10} on the same weight basis.

The other data required for the Cowherd (1985) Model can readily be obtained from the Phase I and II RI results or from photographs taken by Geraghty & Miller Inc., or Metcalf & Eddy Inc. These include the following:

1. Total area of each waste source
2. Estimates of the nonerodible portions of waste area
3. Annual average wind speed at the site (preferably for a period of five years)
4. Fastest mile wind speed (preferably for a period of five years)
5. Estimated number of disturbances of the ponds per month
6. Estimated roughness height for each pond

The Agencies chose the ISCLT Model to quantify the air pathway off-site, because it models annual impacts from area sources at distances greater than 100 meters from source. The PCGEMS version of this model will be utilized and requires air stability data from a nearby STAR station. STAR stations (usually located at airports), measure not only wind speed and directions but stability classes as well. The nearby STAR station to Ormet that closely resembles the wind rose prepared from the meteorological data available in the air monitoring report is that of the wind rose produced at Parkersburg, WV. Ideally, site-specific air stability classes would be more appropriate. However, it is unlikely that this information would have been collected at the site. (See Attachments #2A, #2B, and #3). Additionally, it must be recognized that the use of the Parkersburg STAR station in the model will introduce additional uncertainty. Preliminary air dispersion modeling strategies have identified the need for site-specific meteorological data. More specifically, annual average wind speed, wind direction by 16 sectors and air stability by classes for approximately a 5-year duration are required for the model inputs. These are the data contained in a STAR station file. If Ormet could provide this data in a summarized, usuable format it will be possible to input as much site-specific meteorological data as possible into the models without relying on the Parkersburg STAR station data. Any information provided to the Agencies would be greatly appreciated.

Since, the ISCLT Model is a long range transport model it will be used to calculate the PM_{10} concentrations at any exposure points selected for quantification at distances beyond 100 meters. For example, the nearest downwind receptor that must be evaluated is Proctor, WV. There are also on-site downwind receptors at other areas. For any exposure point calculations closer than 100 meters to the six (6) waste areas, the box model will be applied utilizing on-site wind data.

Should you have any questions please do not hesitate to call the respective project managers.

Respectfully submitted,

Rhonda E. McBride
Remedial Project Officer
U.S. EPA

Rhonda E. McBride for
Richard Stewart
Site Coordinator
OEPA

cc: Bob Fargo, G&M, Inc.
Jack Ubinger Jr., Eckert, Seamans, Cherin & Mallot
Dr. Frank Jones, G&M, Inc.

ATTACHMENT #1

Preliminary PM_{10} Calculation At AM-2 From Emissions From Disposal Pond #5

Assumptions:

1. Particle Size = Medium and Fine Sand, 0.1 - 2mm; Aggregate size distribution mode = 1mm

2. Vegetation = None

3. Average Annual Wind Speed = 3.54m/s (Parkersburg, WV)

4. Area of Disposal Pond #5 ~ 70,000m^2 (Topo Maps - Sheet #12)
   Note: Cross wind width of Disposal Pond #5 ~ 275m

From Cowherd Model 1985:
   Threshold Friction Velocity = 64cm (pg.24)
   Roughness Height = 10cm (pg.27)
   Ratio of Wind Speed at 7m to Friction Velocity = 10.5 (pg.31)

Calculations: $E = 0.036(1-V) \left(\frac{u}{ut} \right)^3 F(x)$

Where:

   E = Annual Average PM_{10} Emission Rate (g/m^2-hr)
   V = Fraction of Surface Vegetative Cover
   u = Mean Annual Wind Speed (m/s)
   ut = Threshold Value of Wind Speed at 7m/s
   x = 0.886 ut/u
   F(x) = Function of x (Cowherd, pg.36)

Conversions:

   ut = 0.64m x 10.5 = 6.7m/s
   $x = 0.886 \left(\frac{6.7 m/s}{3.54 m/s} \right) = 1.7$
   F(x) = 0.63 (pg.36)

Substitution:

$$E = 0.036 (1 - V) \left(\frac{u}{ut} \right)^3 F(x)$$

$$= 0.036 (1 - 0) \left(\frac{3.54}{6.7} \right)^3 (0.63)$$

$$= 3.3 \times 10^{-3} \ g/m^2\text{-hr}$$

$$\boxed{E = 9.3 \times 10^{-7} \ g/m^2 - sec}$$

Box Model: $C = \frac{E \times W}{H/2 \times u}$

Where:

C = Annual Average PM_{10} Concentration (g/m^3)
E = Annual Average PM_{10} Emission Rate (g/m^2-sec)
W = Crosswind Width of the Box (275m)
H = Height of the Box (m) - Calculated Elsewhere = 13m
u = Mean Annual Wind Speed 3.54m/s

Substitution: $C = \frac{E \times W}{H/2 \times u}$

$$C = \frac{[9.3 \times 10^{-7}\ g/m^2\text{-sec}]\ [275m]}{[\ 13/2m\ ]\ [\ 3.54m/s]}$$

$$= 1.1 \times 10^{-5}\ g/m^3$$

C = 11 ug/m^3 at AM-2

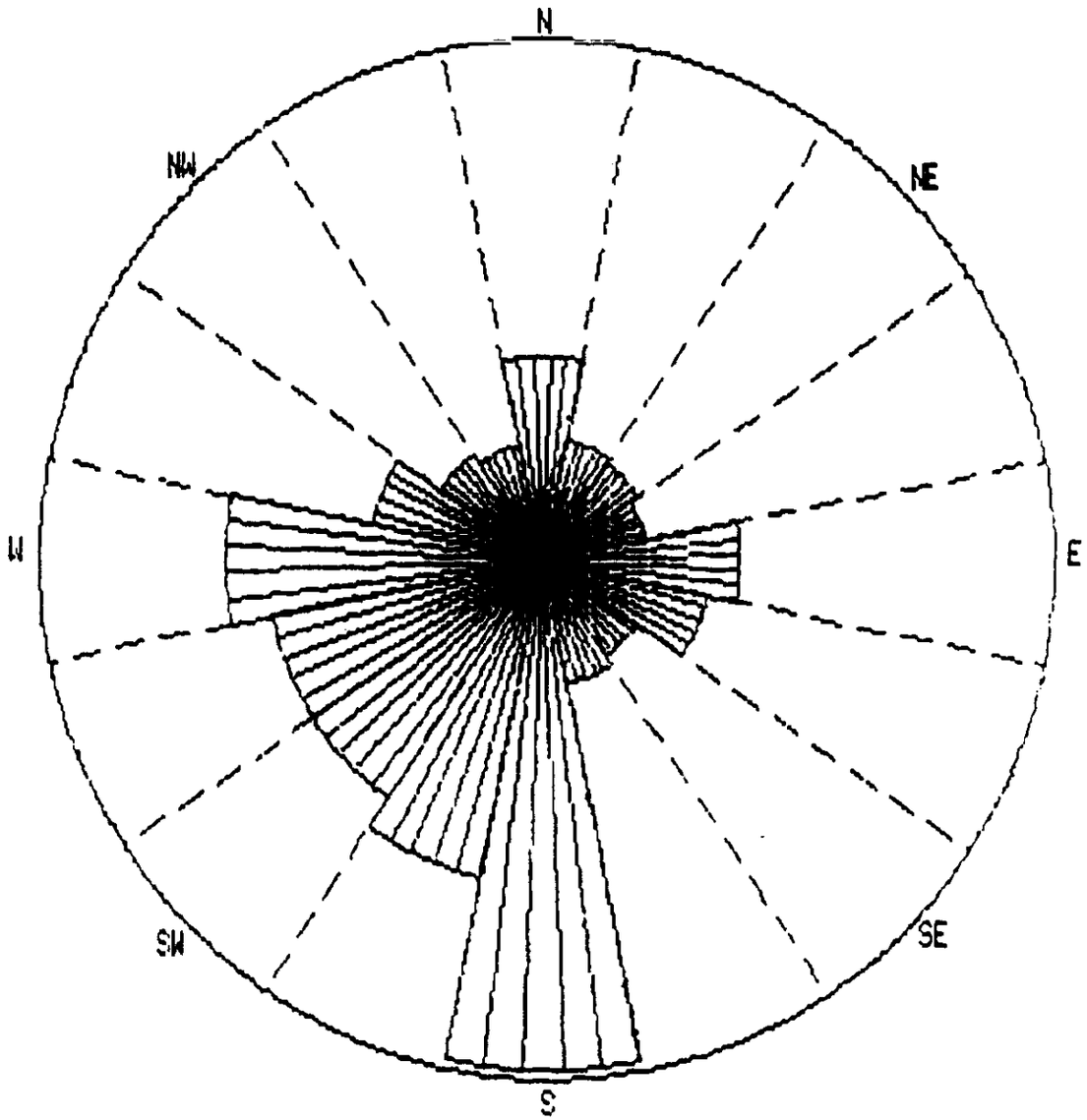
Note: The average PM_{10} concentration monitored at AM-2 was 42 ug/m^3. This value represents approximately 25% of the monitored value.

STAR STATION 0380 PARKERSBURG/PKB-WOOD 1973-1977

PLOT TYPE = WIND DIRECTION

SECTOR (FREQUENCY)

N	6.200E-02
NNE	3.666E-02
NE	3.488E-02
ENE	3.184E-02
E	6.002E-02
ESE	5.117E-02
SE	3.431E-02
SSE	3.777E-02
S	1.536E-01
SSW	9.781E-02
SW	8.682E-02
WSW	8.617E-02
W	9.932E-02
WNW	5.428E-02
NW	3.822E-02
NNW	3.525E-02



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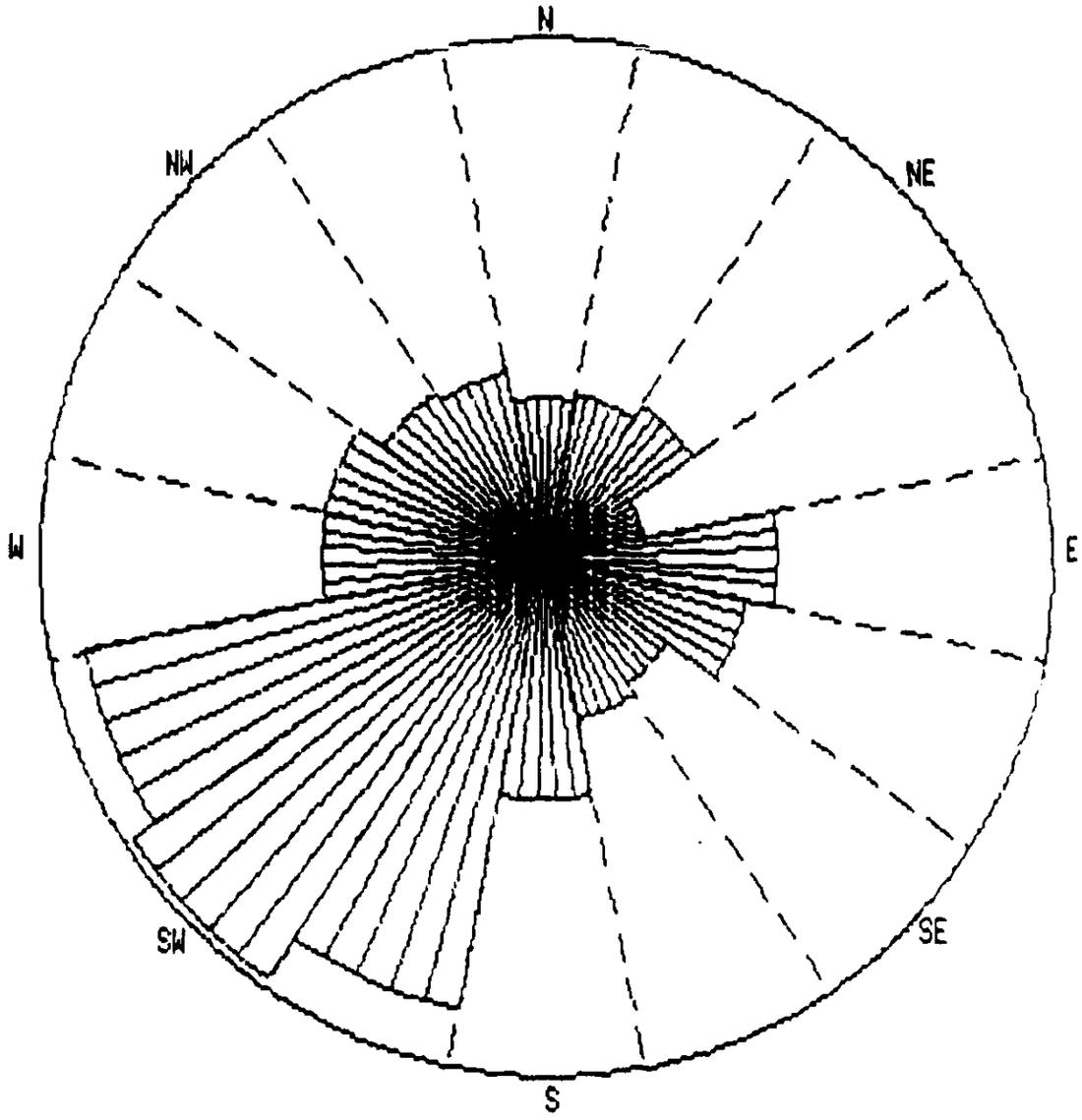
STAR STATION 1386 PARKERSBURG WV 1950-1954

PLOT TYPE = WIND DIRECTION

SECTOR (FREQUENCY)

N	4.077E-02
NNE	4.244E-02
NE	4.674E-02
ENE	2.676E-02
E	6.088E-02
ESE	5.384E-02
SE	3.863E-02
SSE	4.212E-02
S	6.204E-02
SSW	1.179E-01
SW	1.301E-01
WSW	1.230E-01
W	5.769E-02
WNW	5.817E-02
NW	5.071E-02
NNW	4.831E-02



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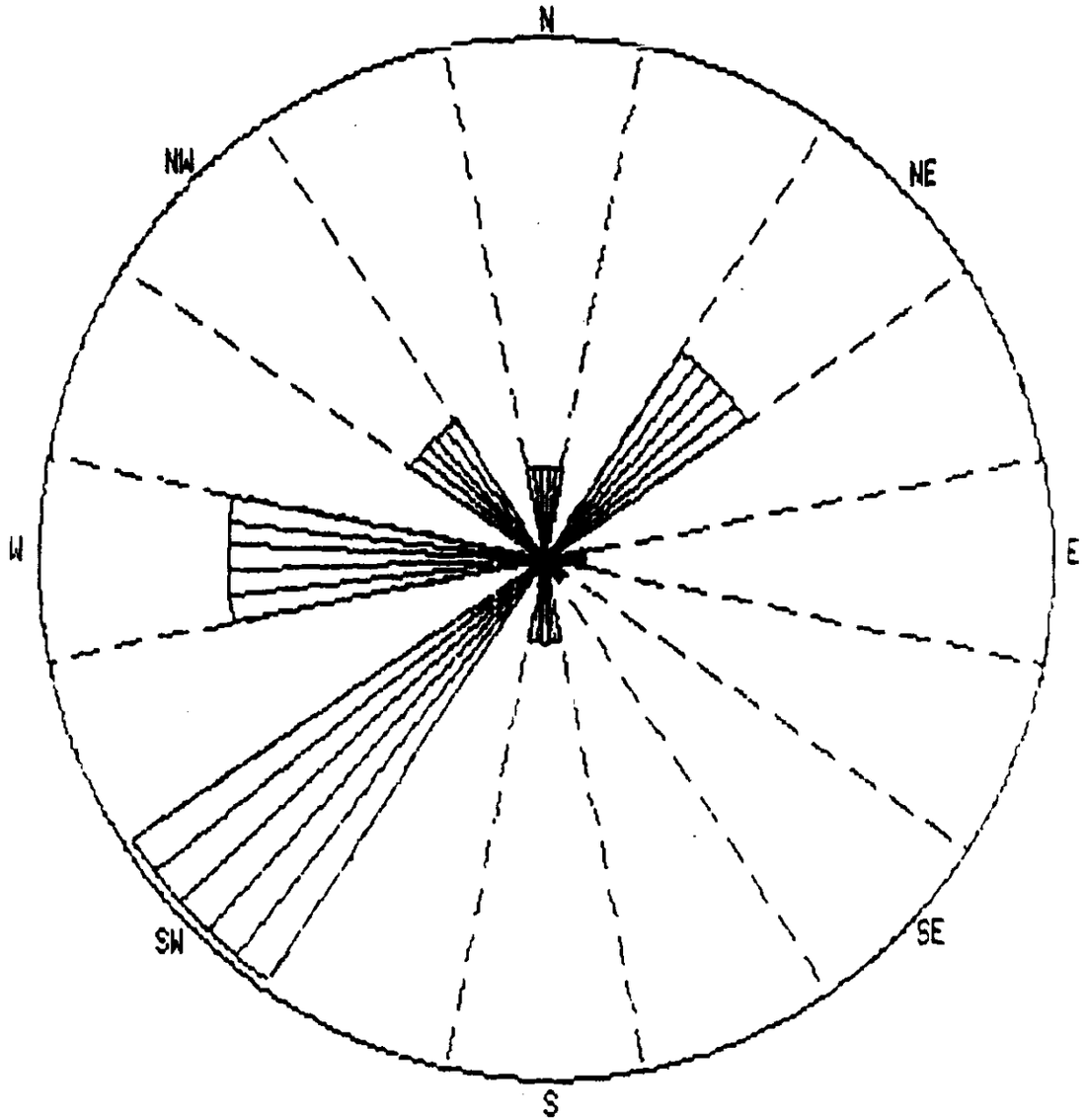
ormet

wind direction

SECTOR	(VALUE)
N	6.200E-02
NNE	0.000E+00
NE	1.660E-01
ENE	0.000E+00
E	2.800E-02
ESE	0.000E+00
SE	1.600E-02
SSE	0.000E+00
S	5.600E-02
SSW	0.000E+00
SW	3.420E-01
WSW	0.000E+00
W	2.180E-01
WNW	0.000E+00
NW	1.100E-01
NNW	0.000E+00



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